Encuentro
Revista de investigación e innovación en la clase de idiomas

CONTENT AND LANGUAGE INTEGRATED LEARNING THROUGH MUSIC AND ICT: SAVING THE GAP

Carlotta San Emeterio Bedia and Isabel de Cruz Cabanillas
University of Alcalá

Resumen

El presente artículo se basa en una investigación[1] llevada a cabo con alumnos con desfase curricular a la hora de adquirir contenidos a través de la lengua inglesa. El método empleado consiste en la realización de dos intervenciones llevadas a cabo durante un año académico en un centro de educación primaria: una a través de la música y la otra por medio de las nuevas tecnologías, incluyendo ésta última la integración del uso de una WIKI. Los resultados muestran cómo estos alumnos pueden alcanzar los objetivos del curso al margen del desfase inicial. Se hace útil y necesaria una enseñanza distinta que implemente estrategias más cercanas a los alumnos del siglo XXI. Las nuevas tecnologías y la música son herramientas poderosas, ayudantes del profesor, que promueven la motivación y la consciencia sobre las propias posibilidades del alumno, haciéndolo autónomo y constructor de su propio aprendizaje

Palabras Clave: AICOLE, nuevas tecnologías, música, dificultades de aprendizaje, Educación Primaria.

Abstract

This paper is based on the research carried out with students behind their expected curricular level when acquiring contents through English. The method used in this study consists of two interventions developed during one academic year in a primary school: the first one with music and the second one with ICT, including the development and integration of a WIKI. The results show that students behind their expected curricular level can succeed, no matter how lost they could be. Teaching in a different way is useful and essential, implementing new strategies adapted to our 21st century students. New technologies and music are powerful tools: Teachers' helpers when used, which promote learners' motivation and awareness of their own possibilities, encouraging them to construct knowledge and to develop their autonomy.

Keywords: CLIL, new technologies, music, learning difficulties, Primary Education.

1. Introduction

Could we teach pupils contents through English when they are so behind that the wall seems unsurmountable? The answer should be yes, because a teacher can open windows to the world, but is this what we are really doing with these students? Are we not closing windows when we take for granted they cannot succeed? In Gardner's words (1983: 33) «It is not how smart you are; but how you are smart». Thus, a different attitude is demanded. Therefore, students' previous knowledge, individual characteristics, learning styles and contexts should be considered to implement the new strategies this article covers. Focusing on students in the sixth grade we will present certain strategies which have been found to be useful in implementing an effective learning for these children.

[1] This article reports on the Action Research Project entitled "Students behind their expected curricular level: Working Science contents in English through music and ICT", presented at Alcalá University in June 2012. The research was carried out at El Buen Gobernador school by Carlotta San Emeterio Bedia and under the supervision of Isabel de la Cruz Cabanillas.

The target students of the research came from various families with a cultural and socio-economic level from lower to middle class. Families have diverse origins and therefore, learners come to the school object of this research from very different backgrounds, previous experiences, knowledge and expectations. Perhaps because of the different cultures, some families do not care about students' curricular and behavioural development. Sometimes, teachers' teams are on their own to get the best results from the students. Learning difficulties are seen at a high rate on a regular basis, but only the cases that have been given an *official diagnosis* are supplemented with some extra individual help in the fields of therapeutic pedagogy, compensatory programmes or from the language and hearing teacher. When many students have Spanish as a second language, English becomes the third. At this point, and considering we are dealing with bilingual education, teaching contents through English becomes a very difficult challenge. In the following chart we can see what the real situation was like at the beginning of the year from Vigotsky's theory perspective (1988: 133):

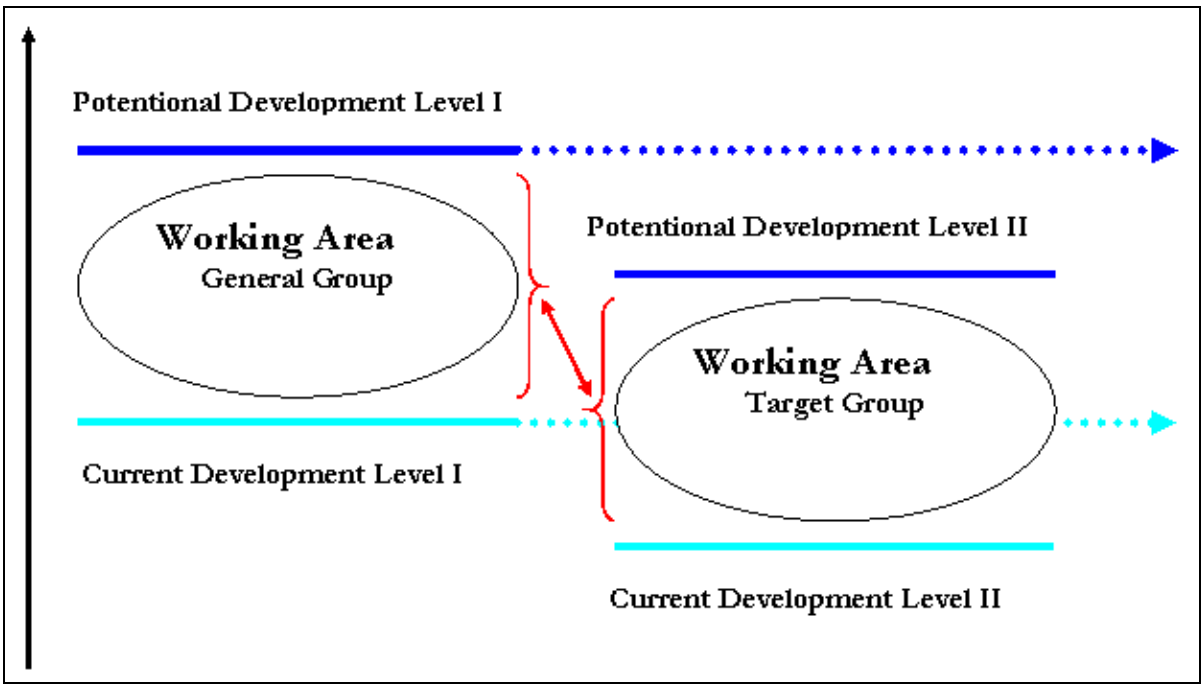


Figure 1: Vigotsky's Theory applied to our study

As can be seen in *Figure 1*, the general group represents the regular group of students in the sixth course of primary education, while the target group represents some students in same year but behind their expected curricular level (those who were the target group of the study.) Here we can see the gap (marked with an arrow), which exists between these two groups.

Additionally, and studying the previous years files of the target students, we discovered that by the end of the first cycle all of them failed English and Science subjects, and that by the end of the second cycle all of them failed Science and only one student passed English (with a 5 out of 10). Therefore, four students in the target group have been failing both English and Science since first course of primary education.

To begin with, we exposed students to the initial evaluation test, and the results were similar to the ones obtained in precious years. All students got marks below 3 out of 10.

After contrasting and analysing this reality, and considering all students within the group, we realised that to assist such a mixture of students we had to include different techniques and tasks. To do so, we had to create new expectations, rising students curiosity to ensure motivation and implication in the learning process. How to do it? According to Lowenstein's model of curiosity, «to stimulate curiosity, it is necessary to make students aware of manageable gaps in their knowledge» (Lowenstein, 1994: 94), rising motivation and the acquisition of strategies, such as learn-to-learn, which is also one of the demands of the Organic Law of Education 2/2006). Therefore, by including new strategies we tried to guarantee, at least to some extent, that we were covering different students' learning styles, capacities and needs, as for example using ICT and music. Why ICT? Because new technologies represent an awesome motivational tool nowadays. Children are born in a digital world and everything related to keyboards, screens and Internet are part of their daily routines. All children born in developed countries are digital-natives (term used by Marc Prensky), which basically means they can easily get used to all new machines, remote controls, mobile phones, laptops and other electronic devices without reading instructions. This is in an intuitive way.

And why music? Because apart from the motivational tool that music is, it improves brain function. Many authors and researches have developed studies to demonstrate this; for instance, Professor Laurel Trainor, director of the Institute of Music and the Mind in Ontario, has investigated how musical training (not necessarily passive listening to music) affects attention and memory, which provides a mechanism whereby musical training might lead to better learning across a number of domains. And this point is where one part of this work starts on: building contents acquisition through music (in Trainor et al. 2012: 129). And here is where our intervention started.

For the development of the investigation, the study design was centred on some specific focus groups: one same target group of students for both interventions but different control groups. Thus, we established the following three focus groups for the music intervention:

1. THE TARGET GROUP which consisted of the five students we were carrying out the intervention with.
2. CONTROL GROUP α which, considering peers' perception to be extremely relevant to the purpose of this work, consisted of another control group within the same class. It consisted of five good students who succeeded in all the areas and were taken as a reference for the rest of the students. This meant that their opinion of others' capacities and possibilities were included in the other students' self-concept.
3. The CONTROL GROUP β was a group of four students with similar characteristics to the target group but in another class. We did no intervention with them during one didactic unit to compare results with target group, what means that music was not included in the teaching of contents guaranteeing the retrieval of more data for comparison. (Considering we were intervening within the same school we only took this control group β within one didactic unit. For the rest of the didactic units we just worked with the first two groups.)

As far as the second intervention with new technologies is concerned, we established the following focus groups:

1. THE TARGET GROUP. We maintained the target group with the same five students behind their expected curricular level.

2. CONTROL GROUP α We included this focus group again since it would be practically impossible for these students to distinguish what improvements of their classmates were devoted to one intervention or another.
3. The CONTROL GROUP γ. This time we had another interesting control group which consisted of all those students who did not use the WIKI (some because they did not care and some because they did not have their parents' permission.) This group was an important source of information, as we will see later.

Additionally, the process of gathering data consisted of a set of questionnaires, interviews, recording videos/audio, observation, a diary, online forum, use of the WIKI, focus groups and external observers. (All these mechanisms have been worked by means of including them within the daily work with the focus groups.)

As stated before, the three pillars of the research were students' perception of themselves, peers' perception and teaching praxis. Therefore, the interventions were analysed and tested considering this:

a. Teacher's Assessment. During the intervention students were assessed in different ways: by means of observation, recording their performance in a diary, taking tests and tasks, being recorded, etc.
b. Self Assessment (target group). These students performed self-assessment in three different ways. Firstly, at the end of each day of students concerned were asked to colour in a chart how lessons and the teacher seemed to them that day and whether or not they considered that they had learnt something. They gave green colour for "yes I liked it / yes I have learnt something"; yellow colour for "normal / not very much"; and red colour for "not at all." The more green colours they gave, the higher their motivation and self-confidence should be. Secondly, after each week of work the target group had to fill in the self-assessment questionnaire again. And finally, in all the tests and activities that the students did, they always had a "self-assessment part" at the end with some questions to reflect upon.
c. Peers' Assessment (control group alpha). At this point, peers' assessment was a helpful indicator: On the one hand, it provided the researchers with their peer's perception of these students, which, on a regular basis, has much more to do with young learners' self perception. On the other hand, it also contributed to this research giving us the reality of the situation in the classroom: according to classmates, were students in the target group improving?

2. Objectives of the Research and Hypothesis Formulated

CLIL (content and language integrated learning) is a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language (in Coyle et al. 2010: 1). In most Madrid's bilingual schools we combine both Science and English areas. Therefore, and in relation with contents taught through English we established the following objectives: On the one hand to include music and ICT in the teaching practice within one academic year. And on the other hand, to measure and compare students performance at two levels: academic and emotional; and at two different moments: at the beginning of the year after introducing certain tools, and at the end of the academic year.

To present a reliable hypothesis we stated some important foundations: firstly, these students found English language to be problematic, having a negative label really integrated in their minds. Secondly, we

considered that peers' negative opinions and thoughts were really obvious to them, having an influence on target students' performances. And finally, they even had some difficulties in the Spanish language to go through Spanish contents too, which made things worse.

Subsequently, we tried to test if students behind their expected curricular level in the sixth grade who were taught Science through music and ICT could improve their learning of contents and get better marks, becoming motivated and enriching peers' esteem towards them as well as their own self-esteem.

3. First Intervention: Music

We did an Intervention within a specific didactic unit (Ecosystems) in the target group's class. (Although music had been integrated as a whole into all units, to collect reliable data we focused on one unit first, and then we compared general findings and results). During the intervention in the didactic unit *Ecosystems*, for the experimental group (target group), the teacher introduced chants and rhythms to help students to memorise contents, trying to motivate learners to sing them in order to internalise these contents. An example of the chants included can be seen in the following table:

e.g.Topic Unit: Ecosystems
Question 1 to work on→ What are the elements of an ecosystem?
Answer: habitats, living things and interaction.
Procedure: including ostinato and gestures.
Chant: *what are the elements of an ecosystem* (x2)
Habitats, living things, interaction, interaction. (x2)
Question 2 to work on→ What groups of living things do we find in an ecosystem?
Answer: Producers which are autotrophs because they make their own food; consumers which are heterotrophs because they feed on others; and Descomposers which descompose the remains of other living things.
Procedure: including ostinato[2], gestures and photos.
Chant: *Producers are autotrophs, they make their own food // Consumers heterotrophs, they feed on others, like you //*
Carnivores, herbivores, omnivores (x2) //
Decomposing the remains of other Living Things,
Decomposers live, as happy as can be.)

Table 1: Chants examples on Ecosystems

Meanwhile, in the control group β, the teacher taught Science lesson without using these strategies.

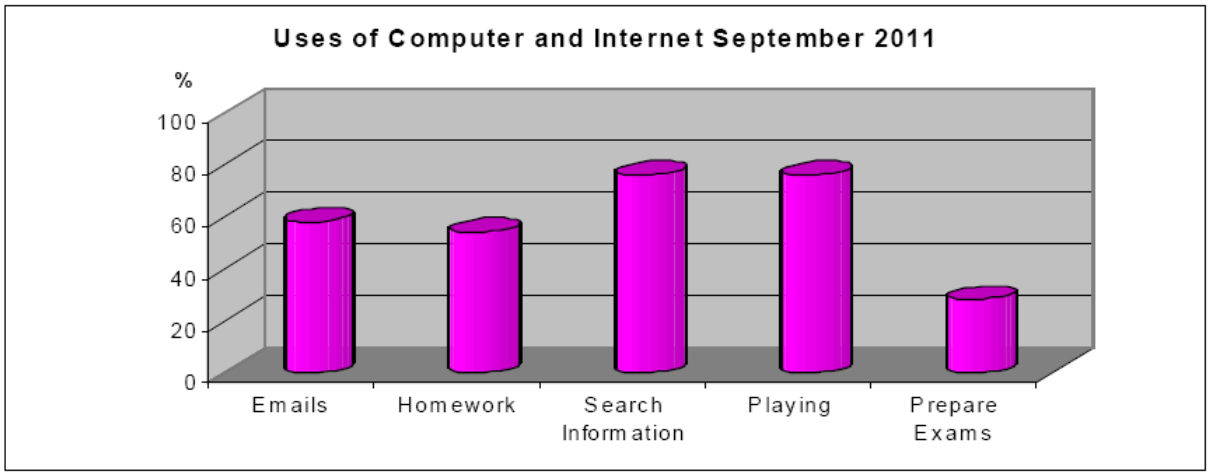
After this short intervention took place, we kept on employing these strategies during lessons, but not considering the beta control group any more. The results and conclusions, both after this first action and at the end of the year will be analysed later.

[2] Ostinato in Music refers to a recurring, frequently repeated pattern.

4. Second Intervention: ICT

This second intervention took place during the whole academic year and it was measured in a different way in comparison with the previous one. For this intervention, the target group of students was observed as well as the whole group, which was significantly distinct from the other intervention. On this occasion, as a control group, we had control group γ: those students who did not use the WIKI.

Since the very beginning of the academic year we considered this an interesting intervention to be developed in conjunction with the music one. We tested students' use of new technologies and digital tools at the beginning of the year by means of a questionnaire. For all the students in year six we got that 88% of them had a computer at home, while 78% had Internet connection. In the following graph we can observe students' answers to the questionnaire in relation with the purpose of using Internet:



Graph 1: Uses of Computers and Internet September 2011

As can be understood from the previous graph, the most common uses of these tools (x-axis) were searching information and playing games (percentage of students in y-axis). In the same questionnaire, students were asked whether or not they considered it necessary to use a computer to study. The results revealed that only 40% of them considered it essential.

Subsequently, we reached the conclusion that new technologies were separate from their daily working process, and therefore at the beginning of October 2011 we started the intervention. Thus, the WIKI http://clilingmesoftly.wikispaces.com was presented to them and to their families as a tool with manifold purposes:

- As a reminder for the homework, projects, class tasks, exams, activities, etc.
- As an organizer for the daily practice.
- As an online teacher: many websites and additional tools can be found on the WIKI pages to reinforce and extend classroom work.
- As a communication tool for students with the teacher: students got an email account. They had tutorials through the Internet from time to time and students could always email their questions to the Teacher at any moment, any day (evenings, weekends, vacations).
- As a public controller of individual work: students post in the forum.

- As a parents' guide about what was going on at school. Apart from the entire information families found there, from time to time students' works, videos, photos, etc, were uploaded. Thus, families, at some point, could get the feeling of being part of the class.

To get access to the WIKI parents had to fill in a consent-document, to allow the teacher to upload photos, videos and students' works. Some families did not consent and in those cases we did not provide them with a username nor a password. Thus, these students could access WIKI contents but could not post in the forum, see their videos and photos in the WIKI, neither send email messages to the teacher.

In the following table we present WIKI's pages at the moment were the research took place.

ORGANIZER	SCIENCE	ENGLISH
Welcome to my Wiki!	Self-Learning Room	Science-Basics
TeacherCarlotta's Working Plan	English-Basics	Science-Human Body
SPECIAL EVENTS	English-Grammar	Science-Living Things
My Amazing Students!!	English-Listenings	Science-Matter & Electricity
Our School's Blog	English-Phonics	Science-Environment
	English-Poetry	Science-Earth
	Great World Museums	Science-Laboratory
	Some Good Music	Science-Geography
		Science-History
		Science-Space
		Science-Madrid Trekking

Table 2: WIKI's content pages

At the end of each didactic unit, students were asked to fill in a questionnaire, to see whether or not they were using and internalising the inclusion of this tool and to compare to what extent it could be related to an improvement in the acquisition of Science contents. The results and conclusions will be discussed in the following section.

5. Findings and Results

5.1 For the First Intervention

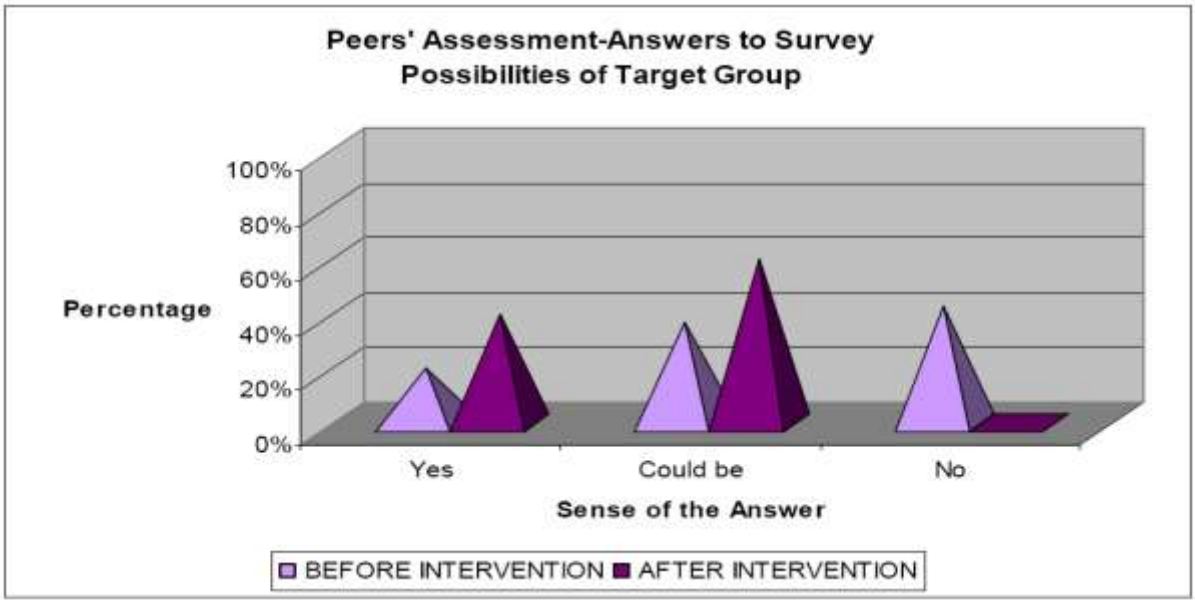
After analysing the results obtained just after the first didactic unit they worked on in the research, the results were quite relevant: there was an important difference between the target group and the control group β. Pointedly, one of the lowest students got excellent results.

As far as self and peers' concept is concerned, the questionnaires[3] drew the following results:

- The Target group demonstrated a higher positive attitude towards their own capacities and possibilities of succeeding. Before the intervention they gave just 38.78% of positive answers to the questionnaire and after just the first unit they gave a total of 82.22% of positive answers, which indicated an unquestionable change in their minds.

[3] The questionnaire consisted of a set of statements in the way *I can do something*. (e.g. I can pass Science)

- With reference to the peers' concept of the students in the target group we could observe also an interesting twist before and after this first part of the intervention (see graph 2). Peers also had a specific questionnaire to fill in answering questions about the capabilities of their mates in the target group. They could give just *yes*, *could be* or *no* answers. What was most significant was that after the first didactic unit all students in control group alpha saw their mates as capable of making progress and learning. We include the following graph:



Graph 2: Peers' assessment on the possibilities of the target group

Some of the arguments students in control group alpha made to support their answers to the survey were related to an improvement in the motivation and to the use of the music strategy.

After each of the didactic units we worked on, students maintained up the good results and were more and more motivated asking for new songs and chants for the different contents. As a result of that their intrinsic motivation increased and the whole classroom environment was *infected* with a positive attitude.

5.2 For the Second Intervention

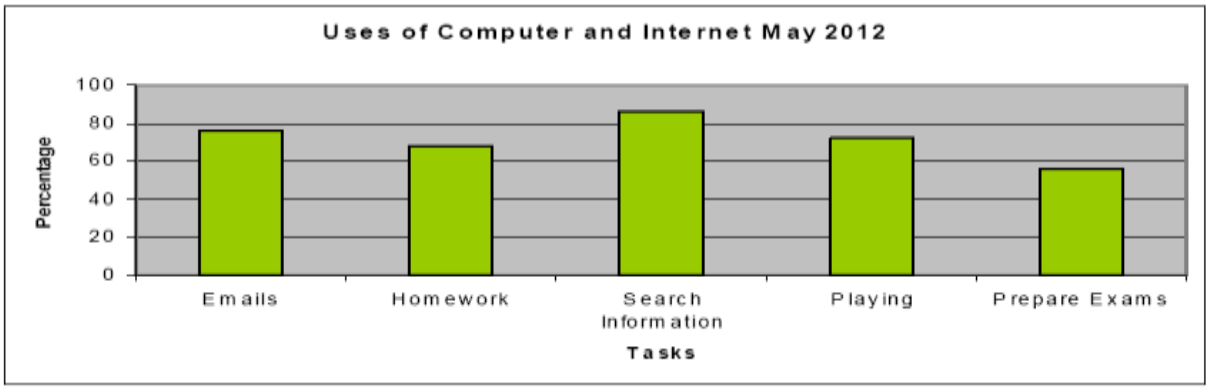
By the end of the academic year we had observed a great improvement in the use of digital tools and in students' progress too. Generally speaking, to all students the WIKI seemed to be a positive and motivating tool, increasing the number of interactions and participations in it. Students with usernames and passwords expressed that they liked using the WIKI in Science for the following purposes:

- watching videos related to topic-units,
- making digital stories,
- having a look at their own works, photos, videos, recordings, etc.
- having a look at class-mates works, photos, videos, recordings, etc.
- searching for information when preparing projects,
- playing games in the different web-sites the WIKI offered,
- be in touch with the teacher to ask questions and for clarification, and
- posting on the forum to get extra points.

With reference to the students behind their expected curricular level, the WIKI was useful to learn and to study. They wrote emails messages from time to time but did not participate very actively in the forum. Nevertheless, the students in the target group demonstrated an increase in the use of the new technologies, which helped them to improve their English work.

In general terms, students were motivated and enthusiastic in their work with and through the WIKI. They used the WIKI to post messages in the forum, which allowed them to gain some extra points. An average of 16 students had been answering regularly in the different discussions we posted. (This was about 50% of those that had access with a username and password.) The reasons why the others did not participate were related to parents' refusal to allow their children to use the computer or to the lack of interest in some cases. Occasionally, compulsory discussions were posted, which had to be answered in order for students to pass the subject area. In such cases, those who had no username could write down their opinions and answers on a piece of paper. This was the case for History topics, for example. Although students were asked to complete the assignment many times, and despite the fact that they even had time at school to do so, the same number of students did not post their answers. This time, parents could not be held responsible. We realised that a small group of 5-6 students had little motivation with this tool.

By the end of the academic year, and in comparison with graph 1, students' answers (x-axis) had changed, showing now a higher percentage (y-axis) of positive answers to the use of new technologies for academic purposes:

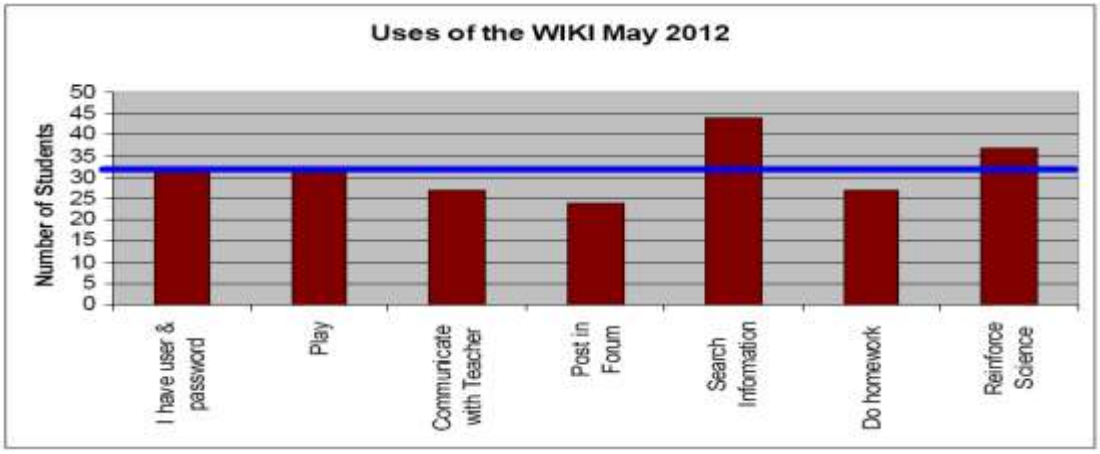


Graph 3: Uses of Computers and Internet May 2012

Once again, students were asked whether or not they considered it necessary to have a computer to study. Now, 62 % of the total considered it a must, including the five students in the target group.

Additionally, in the same final questionnaire students argued that there were other digital tools they enjoyed using during the academic year in Science, such as Power Point, Word and Paint, VLC video editor, *Keproff* site (digital stories creator) and Smart programme for interactive activities and games on the digital board.

As far as the WIKI is concerned, the number of students who used the WIKI for different purposes is represented in the following graph:



Graph 4: Uses of the WIKI May 2012

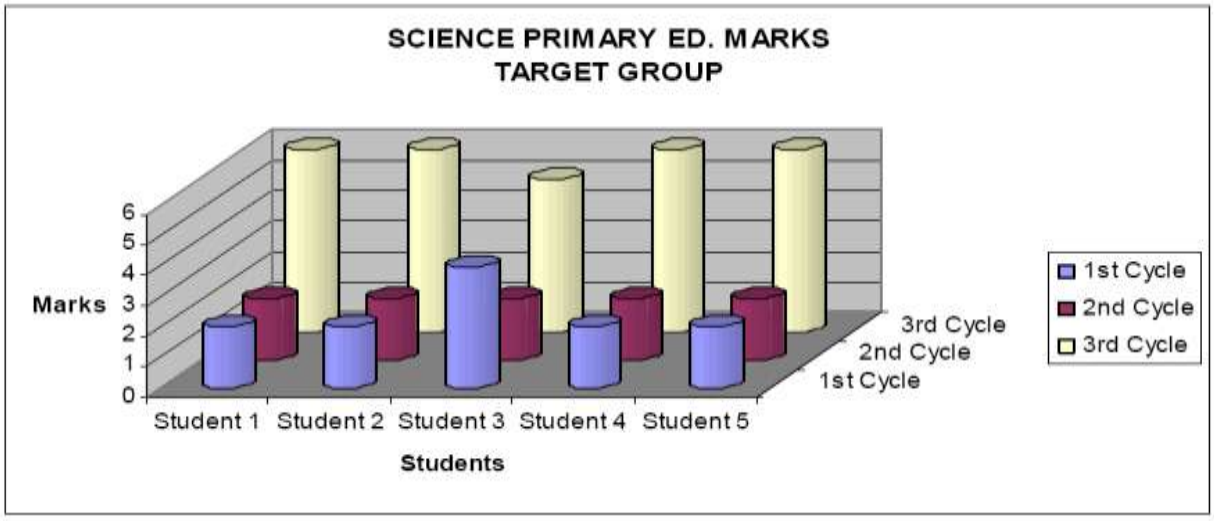
From the previous graph we realised that even those students who had neither username nor password, used the WIKI for searching information and to reinforce Science contents we had already worked on in class. This is an interesting fact that shows to some extent how these students had integrated the WIKI into their daily praxis at home.

5.3 For the General Purpose of the Research

Obviously we cannot divide the final results into two parts, because students' final outcomes were related to the whole process. Thus, by the end of the year some final results that involved both processes of intervening were the following:

- In terms of curricular objectives attainment we got that all students in the target group were able to pass the subject.
- In terms of students' motivation we got that both, target students and peers, had a really good label integrated about the possibilities of success approaching contents through English language.

In the following graph we get a comparative of the final results at the end of May (which corresponds with the years' final marks). We can notice the highest mark was a 6 out of 10, but all students passed having at least a 5. Since this was the end of the third cycle of Primary Education, and considering they were failing since year 1; year 6 can be considered a big step ahead in students' performance, as ban be seen in Graph 5:



Graph 5: The target group's marks on Science throughout the Primary Education

6. Conclusions

Considering the needs we observed in students behind their expected curricular level to face contents through English, we established an action research project which should cover two kinds of interventions, implementing music and ICT as part of the teaching practice in the Science subject. For the development of this investigation we focused on students in year six of Primary Education and in a school located in the urban centre of Torrejón de Ardoz. Both interventions have been explained and analysed in detail. Taking into consideration all the aspects which have been shown above, we can present some conclusions.

As far as our group of study is concerned we could agree that success was not perfect, of course, but these students became able to pass the subject demonstrating understanding and integration of contents. Thus, we concluded that the intervention was effective. The teacher's implementation of rhythms, chants, and projects which required the use of ICT resources seemed to have a positive effect on the students' results, as shown in the final marks. Therefore, our hypothesis that both music and ICT would be tools that would enhance students' motivation and performance was validated.

Clearly, it is not only working with music and ICT that affects behaviour and attitude towards Science. Obviously, the results were affected by several factors, such us teacher's style, learning styles, etc. Many of these students had problems and difficulties for many other reasons (mainly socio-cultural and economic). Nonetheless, considering all the data collected within the research process, with these interventions in Science lessons, it has been shown how students behind their expected curricular level improved their motivation; they increased their self-esteem levels; and they developed a desire for learning and progress, which was demonstrated by the positive results in the acquisition of contents. And additionally, not only were these aspects reinforced, but the rest of the students in the whole group also improved their attitudes towards the acquisition of contents through English.

To conclude, we consider we are able to assert that students behind their expected curricular level can definitely succeed when strategies and lessons are integrated including music and new technologies. These tools have much to do with the way in which our brain works and integrates contents. Including music and rhythm in Science lessons as well as the WIKI not only engages students (regardless of the previous difficulties they had), but also fosters memorization mechanisms, will of improvement and an obvious progress in the acquisition of contents.

7. References

Corrigall, K.A., & Trainor, L.J. (2011). «Associations between Length of Music Training and Reading Skills in Children». *Music Perception*, 29, 147-155.

Coyle, D., Hood, P., Marsh, D. (2010). *Content and Language Integrated Learning*. Cambridge: Cambridge University Press.

Gardner, H. (1983). *Frames of Mind*. London: Paladin Books.

Loewenstein, G. (1994). «The Psychology of Curiosity: A Review and Reinterpretation». *Psychological Bulletin*, 116/1, 75-98.

Organic Law of Education 2/2006.

Punset, E. & Prensky, M. (2011). *Crear hoy escuelas para mañana*. Programa TV: Redes para la Ciencia, 77.

San Emeterio Bedia, C. (2012). *Students behind their expected curricular level: working Science contents in English through music & ICT*. Unpublished Master's Thesis presented at the University of Alcalá.

Trainor, L. J. et al. (2012). «Becoming musically enculturated: effects of music classes for infants on brain and behaviour». *Annals of the New York Academy of Sciences*. Issue: *The Neurosciences and Music IV: Learning and Memory*. 129-138.

Vigotsky, L. (1988). *El desarrollo de los procesos psicológicos superiores*. México: Editorial Crítica, Grupo editorial Grijalbo.

Carlotta San Emeterio Bedia is a Piano Teacher by *Conservatorio Ataulfo Argenta*, in Santander, and a specialist in teaching through English in Bilingual Schools, Master in TEFL by University of Alcalá. She has worked in the Bilingual Programme of the Autonomous Community of Madrid since 2008. She is currently working on her PhD Thesis and is a teacher at El Buen Gobernador school.

E-mail: sanemeteriobedia@gmail.com

Isabel de la Cruz Cabanillas is a Senior Lecturer in English at University of Alcalá, where she teaches courses on English language and linguistics at undergraduate and postgraduate level. Her research interests are chiefly in the field of English linguistics, especially lexicology and semantics, and second language teaching. Her publications are both in diachronic and synchronic linguistics. She has contributed to international journals, such as *Cahiers de Lexicologie*, *Studia Anglica Posnaniensia*, *English Studies* and *English for Specific Purposes*, as well as volumes edited by different international publishing houses. E-mail: isabel.cruz@uah.es